

Remarks

Claims 1-11, 14, and 17-19 were pending in the subject application. By this Amendment, the applicants have amended claim 10 and added new claim 43. Support for the claim amendments can be found throughout the application as originally filed including at, for example, page 4, lines 20-23 for the recitation of "lower alcohol" and claims 1, 7, 9, and 10 for the recitation of "wherein the volatile solvent is a lower alcohol and the non-volatile solvent is water and/or a glycol." Accordingly, claims 1-11, 14, 17-19, and 43 are now before the Examiner for consideration.

The amendments presented herein have been made to lend greater clarity to the claimed subject matter and to expedite prosecution of the subject application. These amendments should not be construed as an indication of the applicants' agreement with, or acquiescence to, the rejections of record. Favorable consideration of the claims now presented, in view of the remarks and amendments set forth herein, is earnestly solicited.

The applicants wish to thank Examiner Huang and Supervisory Examiner Shosho for the courtesy extended to the undersigned and Ms. Mi Zhou during the personal Examiner Interview conducted March 2, 2011. This response and the amendments set forth herein are submitted in accordance with the substance of that interview and constitute a summary thereof.

Claims 1-4, 6-10, 14, and 18 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Caselli *et al.* (EP 1146111) in view of Stevens (U.S. Patent No. 5,712,237) and Scheuing *et al.* (U.S. Patent Application Publication No. 2003/0220223). The applicants respectfully traverse this rejection because there would be no reason to combine or modify the reference teachings to arrive at the current invention.

The current invention is directed to a vapor-producing composition absorbed onto a carrier that is a non-woven material comprising cellulosic fibers and plastic, or is amorphous silicon dioxide. Advantageously, the composition of the current invention can, via vapor release, disinfect a space surrounding the carrier for a prolonged period of time.

As is acknowledged in the Office Action, the primary Caselli *et al.* reference fails to teach or suggest the following claim limitations: 1) the percent weight ratio of volatile to non-volatile solvent is in the range of 3:1 to 1:3; and 2) the carrier is a non-woven material comprising cellulosic fibers and plastic, or is amorphous silicon dioxide (claim 1), (Office Action at paragraphs 5 and 7).

In addition, the Caselli *et al.* reference fails to teach or suggest a vapor-producing composition. The term “vapor producing” is not an intended use, but is a physical characteristic of the space-disinfecting composition of the current invention, and, thus, must be afforded patentable weight.

With regard to claim 43, the Caselli *et al.* reference further fails to teach or suggest that the volatile solvent is a lower alcohol and the non-volatile solvent is water and/or a glycol. The use of a lower alcohol as the volatile solvent and glycol and/or water as the non-volatile solvent provides significantly superior effects for disinfecting a space. Examples 9 and 10 demonstrate that the use of a range of lower alcohols and glycols achieves superior effects for disinfecting a space. Example 11 also shows that a solvent mix of water and a lower alcohol (iso-propanol) results in a composition having superior antimicrobial properties for disinfecting a space over a prolonged period of 8 weeks.

While the Caselli *et al.* reference includes at paragraphs [0023] and [0110]-[0126] an extensive list of possible solvents, a person skilled in the art, in view of the cited references, would have had no reason to specifically select lower alcohol as the volatile solvent and water and/or glycol as the non-volatile solvent.

The mere fact that the purported prior art could have been combined or modified in some manner to yield an applicant’s invention does not make the combination or modification obvious unless “there was an apparent reason to combine the known elements in the fashion claimed” by the applicant. *KSR International Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741 (2007). An applicant’s invention is not “proved obvious merely by demonstrating that each of its elements was, independently, known in the (purported) prior art.” *Id.*

As discussed below, in the current case, one skilled in the art would have no reason to modify the Caselli *et al.* reference to arrive at the current invention. One skilled in the art would also have no reason to combine Caselli *et al.* with Stevens or Scheuing *et al.* Without a reason to combine or modify the reference teachings, a *prima facie* case of obviousness cannot be established.

The Caselli *et al.* reference does not teach or suggest the currently-claimed vapor-producing composition. Rather, the Caselli *et al.* reference is directed to anti-microbial compositions that disinfect hard surfaces via direct contact. Specifically, the anti-microbial composition of Caselli *et al.* is impregnated into a wipe, which is then brought into contact with a hard surface in order to

disinfect said surface. This is evidenced throughout the Caselli *et al.* reference including for example, at paragraph [0020], stating that “the composition . . . needs to be contacted with the hard-surfaces to be disinfected.” As such, the nature of the problem to be solved by Caselli *et al.* differs significantly from the problem that is addressed by the current invention, which is directed to disinfecting a space. Unlike in Caselli *et al.*, the composition of the current invention does not need to be brought into direct contact with any surface or article to be disinfected.

The Caselli *et al.* reference also states that “solvents will, advantageously, give enhanced cleaning and disinfecting performance to the composition. Suitable solvents include those known to those skilled in the art of hard-surface cleaner compositions.” (paragraph [0110]), (emphasis added). This is evidence that cleaning and disinfection of hard surfaces is distinct from disinfection in general; there are particular considerations and requirements for producing compositions suitable for cleaning and disinfecting hard surfaces. Disinfection of a space, which occurs via vapor action, presents challenges that are distinct from cleaning and disinfection of a hard surface via direct physical contact. A skilled artisan, when reading the Caselli *et al.* reference, would consider these different aims and technical considerations.

Please also note that the anti-microbial, disinfection data presented in the Caselli *et al.* reference were generated by a standard disinfectant test (termed 'EN1276'; see paragraph [0142]) carried out on one occasion per test formula. This basic single-test screening method is in contrast to the present invention, the objective of which is long-term disinfection via the vapor phase, as demonstrated in Tables 1, 3, 7, 8 and 10 of the Examples. The table in paragraph [0141] of the Caselli *et al.* reference discloses various components of the disinfecting composition for contacting a hard surface, wherein the compositions I-III are comparative examples, and the compositions IV-VI are the active compositions (paragraph 0142). For disinfecting a hard surface, the compositions I, II and III do not perform well against gram negative or gram positive bacteria in comparison with compositions IV-VI (the table on the top of page 15).

While the Caselli *et al.* reference includes at paragraphs [0023] and [0110]-[0126] an extensive list of possible solvents, it provides no suggestion or motivation for arriving at the claimed composition, which comprises a mixture of volatile and non-volatile solvents in the claimed range of 3:1 to 1:3.

With respect to the ratio of volatile to non-volatile solvent, the Office Action cites col. 6, lines 30-35 and col. 10, lines 50-52 of Stevens. The Stevens reference is directed to a composition for degreasing textiles (see for example, Stevens at column 2, lines 26-30, Abstract and claim 1). The teachings of Stevens *et al.* differ significantly from Caselli *et al.* and the current invention. Specifically, nowhere does the Stevens reference suggest a composition for disinfection purposes, *i.e.*, for the prevention of proliferation of microorganisms.

The Office Action indicates that it would have been obvious to one of ordinary skill in the art to choose a percent weight ratio of the Stevens composition – a composition for degreasing and cleaning textile, to modify the anti-microbial composition disclosed in Caselli *et al.* for disinfecting a hard surface (paragraph 7). The applicants respectfully disagree.

A person skilled in the art would have no reason to take the solvent ratio of a textile-degreasing composition disclosed by Stevens, to adjust a completely different anti-microbial, surface-disinfecting composition disclosed by Caselli *et al.* The reasons provided in the Office Action, such as promoting the distillation, compatibility, likelihood of forming azeotropes with other cosolvents, and solubility with hydrophilic stains and contaminants, have nothing to do with improving the surface-disinfecting, anti-microbial composition disclosed by Caselli *et al.*

In addition, the ratios of volatile to non-volatile solvent of the compositions disclosed by Caselli *et al.* reside far outside of the claimed range of 3:1 to 1:3; thus, the Caselli *et al.* reference, in fact, directs away from the current invention. The ratio (by weight) of volatile to non-volatile solvents in compositions IV, V and VI of the Caselli *et al.* reference is from 1:9.38 to 1:11.42. This is calculated for each of columns IV to VI by adding together the values of each ingredient. As the values in the table are % w/w values, they must add up to 100. Water is the only non-volatile solvent included in the ingredients and, as indicated on the first row of the table, this is added “to balance” (*i.e.* to bring the total for each column to 100%).

Using column IV as an example, the total of all the known ingredients is 11.853%. Therefore, the water content of this composition is $100 - 11.853 = 88.147\%$. Ethanol is the volatile solvent in this example, and the content is 9.4% (see page 14 line 31). 88.147 divided by $9.4 = 9.38$. Therefore, the ratio of volatile to non-volatile solvents in column IV is **1: 9.38**. The ratio of volatile

to non-volatile solvents was calculated for columns V and VI in the same manner, and the ratios were calculated to be **1: 11.37** and **1:11.42**, respectively.

Further direction away from the claimed ratio is provided at the table in paragraph [0141] in combination with the teaching of paragraph [0127]. The “non-solvent active” content (all except the solvent and water) in columns IV to VI of the table are from 0.623 to 2.453% and it is stated in [0127] that the greatest solvent content is 20% by weight. Therefore, if 20% w/w solvent is used, the amount of water will be around 77.5 to 79.4%. As such, even when the maximum solvent content according to the teachings of Caselli *et al.* is applied, the volatile to non-volatile ratio of the composition is still around 1:4, and, therefore, resides outside of the claimed range.

The Office Action states that “in the case where the claimed range ‘overlap or lie inside ranges disclosed by the prior art,’ a *prima facie* case of obviousness exists. *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); *In re Woodruff*, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990).” (Office Action at paragraph 47), (emphasis added). In other words, a *prima facie* case of obviousness arises if a composition, which has a range that overlaps or encompasses the claimed range, is taught or suggested by the prior art.

In the current case, the cited prior art does not disclose any composition that has a range that overlaps or encompasses the claimed range. In addition, as discussed above, there would be no reason to combine or modify the reference teachings to arrive at a composition having a range that overlaps or encompasses the claimed range. Accordingly, a *prima facie* case of obviousness has not been established.

With regard to the carrier, the Office Action cites paragraphs 0070-0074 of Scheuing *et al.* The Scheuing *et al.* reference is directed to a method for forming hydroscopic polymer gels to improve cleaning performance as well as cleaning compositions containing such hydroscopic polymer gels for application to a surface (see for example, Scheuing *et al.* at paragraph 0017, Abstract, claim 1). Nowhere does Scheuing *et al.* teach or suggest a composition for disinfecting a space.

A skilled artisan would have no reason to combine Scheuing *et al.* with Caselli *et al.*, or to specifically select a non-woven material to modify Caselli *et al.* In Caselli *et al.*, the composition is absorbed into a wipe (paragraph [0022]), which is defined as a disposable towel that allows

disinfecting of surfaces in one step (see paragraph [0139]). There is no teaching in Caselli *et al.* of the nature or composition of a suitable wipe, and certainly no suggestion of suitable carrier materials being non-woven materials comprising cellulosic fibers and plastic, or amorphous silicon dioxide. There is also no suggestion in Scheuing *et al.* for specifically selecting a non-woven material for combination with the compositions disclosed in Caselli *et al.*

In fact, the Caselli *et al.* reference does not address the problem of disinfecting a space; therefore, it does not teach or suggest a skilled person to select the appropriate carrier materials for disinfecting a space as claimed in the current invention. The function of the carrier according to the current invention is to release the disinfecting composition into the surrounding space or environment, and the choice of the carrier material affects the release rate and release characteristics of the active ingredients (see page 5 lines 20-27). In contrast, the wipe used by Caselli *et al.* does not provide any such function; it simply acts as a physical means of transferring the composition to the surface to be cleaned in a single step.

Furthermore, a *prima facie* case of obviousness may be rebutted by evidence that the claimed invention yields unexpectedly improved results over the prior art. See *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1988), *In re Sebek*, 465 F.2d 904, 907 (C.C.P.A. 1972). The fact that the elements work together in an unexpected and fruitful manner supports the conclusion that the applicant's invention was not obvious to those skilled in the art. *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741 (2007), *U.S. v. Adams*, 383 U.S. 39 (1966).

Here, the claimed ratio of volatile to non-volatile solvent in the range of 3:1 to 1:3 provides unexpectedly significant improvements on anti-bacterial effects over the prior art ranges. As is illustrated in the third and fourth rows of Table 3 (specification at page 10, Example 3), a 3:1 ratio of volatile to non-volatile solvent provides prolonged anti-bacterial activity for eight weeks, while a composition with even a slight increase in the amount of volatile solvent to 5:1 can only achieve anti-bacterial activity up to four weeks and exhibits suboptimal anti-bacterial effects at six and eight weeks. This unexpectedly improved anti-bacterial effect, which can only be achieved at the claimed range, further evidences that the applicants' invention is not obvious to those skilled in the art. Neither this advantage, nor the solvent ratios required to achieve the advantage, is taught or suggested by any of the cited references.

In view of the foregoing, the applicants respectfully submit that there would no reason to combine the reference teachings. Further, the unexpectedly superior space-disinfecting property evidences that the current invention is not obvious. Accordingly, the applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a).

Claim 5 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Caselli *et al.* (EP 1146111) in view of Stevens (U.S. Patent No. 5,712,237) and Scheuing *et al.* (U.S. Patent Application Publication No. 2003/0220223), and further in view of Julemont *et al.* (U.S. Patent No. 6,380,152).

The shortcomings of the Caselli *et al.*, Stevens and Scheuing *et al.* references in combination have been discussed above. The Julemont *et al.* reference does not cure, or even address, the aforementioned shortcomings. Accordingly, the applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a).

Claim 11 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Caselli *et al.* (EP 1146111) in view of Stevens (U.S. Patent No. 5,712,237) and Scheuing *et al.* (U.S. Patent Application Publication No. 2003/0220223), and further in view of McCue *et al.* (U.S. Patent No. 5,403,587).

The shortcomings of the Caselli *et al.*, Stevens and Scheuing *et al.* references in combination have been discussed above. The McCue *et al.* reference does not cure, or even address, the aforementioned shortcomings. Accordingly, the applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a).

Claim 17 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Caselli *et al.* (EP 1146111) in view of Stevens (U.S. Patent No. 5,712,237) and Scheuing *et al.* (U.S. Patent Application Publication No. 2003/0220223), and further in view of Caunt *et al.* (EP 0965541).

The shortcomings of the Caselli *et al.*, Stevens and Scheuing *et al.* references in combination have been discussed above. The Caunt *et al.* reference does not cure, or even address, the aforementioned shortcomings. Accordingly, the applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a).

Claim 19 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Caselli *et al.* (EP 1146111) in view of Stevens (U.S. Patent No. 5,712,237) and Scheuing *et al.* (U.S. Patent Application Publication No. 2003/0220223), and further in view of Hartman *et al.* (U.S. Patent Application Publication No. 2005/0106121).

The shortcomings of the Caselli *et al.*, Stevens and Scheuing *et al.* references in combination have been discussed above. The Hartman *et al.* reference does not cure, or even address, the aforementioned shortcomings. Accordingly, the applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a).

In view of the foregoing remarks above, the applicants believe that the currently pending claims are in condition for allowance, and such action is respectfully requested.

The Commissioner is hereby authorized to charge any fees under 37 CFR §§1.16 or 1.17 as required by this paper to Deposit Account No. 19-0065.

The applicants also invite the Examiner to call the undersigned if clarification is needed on any of this response, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,



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Attachment: Request for Continued Examination (RCE)